

- Att
On*
78. Carpet having a pile surface comprising yarn according to claim 60.
79. Fabric comprising yarn according to claim 60. *[Stricken]*
-

REMARKS

Claims 1, 3 and 9 have been rewritten to overcome the rejection of the subject application, as discussed in detail below. New claims 10-79 have been added to define additional or more specific features and embodiments of the invention. Support for the rewritten and new claims is discussed below.

Claims 1 and 9 have both been amended to replace both occurrences of the term "comprising" with the expression "consisting essentially of," thereby more specifically defining both the polymer content of the filaments and the filament content of the yarns. Claim 3, which is dependent from claim 1, has been amended to recite that the propylene polymer is a homopolymer polypropylene, thereby reflecting consistency with amended claim 1. Support for these amendments is found in the specification in the paragraph bridging pages 28-29 with respect to polymer content and in the paragraph bridging pages 38-39 with respect to the filaments. Claims 1 and 9 have also been amended to delete the term "about" in reference to the recited Plug Crush Recovery value, support being found at page 37, lines 1-4. Claim 9 has also been amended to recite that the yarn consists essentially of about 70 to about 300 filaments, that the filaments have deniers of about 8 to about 30 and that the yarn has a bulk level of about 5 to about 15% and denier of about 500 to about 3000. Support for the recited bulk levels is found at page 37 lines 15-18 and support for the recited filament counts, deniers per filament, and yarn deniers appears at page 38 lines 21-26.

New claims 10-30 have been added to claim the yarns of claim 1 and certain of its dependent claims in terms of additional features, including one or more aspects of filament composition, yarn properties and end use. Support for claim 10, with its recitations regarding propylene copolymer and at least one

copolymerizable monomer, appears at page 28 lines 12-19. Support for claims 11, 14, 16 and 24, reciting bulk levels of about 2 to about 20%, is found in claim 2 and at page 36 lines 22-25 describing the recited bulk levels as preferred. Support for claims 12, 15, 17, 19, 25 and 27, reciting Plug Crush Recoveries of at least about 87, is found at page 41 lines 1-3 describing such values as especially preferred for carpet yarns. Support for claims 13 and 23, reciting that the propylene polymer contains at least one additive of the recited types is found at page 29 lines 8-20 describing the recited additives and incorporation thereof into the propylene polymer. Support for claims 18 and 26, reciting that the yarns have about 40 to about 300 filaments per yarn, is found at page 38 lines 9-12 describing such filament counts as preferred for carpet yarns. Support for claims 20, 22, 28 and 30, directed to carpets having a pile surface comprising the claimed yarns, is found in the description of carpets comprising the invented yarns at page 39 line 26 - page 40 line 31. Support for claims 21 and 29, directed to yarns with Plug Crush Recoveries of at least about 90% is found at page 39 lines 16-20 describing such values as particularly preferred with respect to resilience and compressional recovery of yarns.

New independent claim 31 is directed to yarns with recited bulk levels and Plug Crush Recoveries consisting essentially of continuous filaments consisting essentially of homopolymer polypropylene or homopolymer polypropylene and one or more additives. New claims 32-40 are dependent from claim 31 and recite additional properties and end uses. Support for claim 31 is found in claims 1 and 3 with respect to the recited yarn structure, bulk levels and Plug Crush Recoveries, in the passages noted above in connection with the amendments to claims 1 and 3 with respect to filament content of the yarn and propylene polymer content of the filaments, at page 28 line 12 with respect to polypropylene homopolymer and at page 29 lines 8-16 with respect to the recited additives. Support for the dependent claims is found at page 38 lines 7-9 and 17-20 with respect to the filament count and deniers per filament recited in claim 32, at page 38 lines 23-26 with respect to the filament count and yarn deniers

recited in claim 33; at page 37 line 32 - page 38 line 2 with respect to the bulk level recited in claim 36; and in the passages cited in the preceding paragraph with respect to Plug Crush Recoveries and carpets according to claims 34, 35 and 37-40.

New independent claim 41 is directed to the invented yarns with recited Plug Crush Recoveries and in which the filaments consist essentially of propylene polymer that is a homopolymer polypropylene or a copolymer of propylene with at least one copolymerizable monomer or of a blend of such propylene polymer with another polymer, with the proviso that when the other polymer is a polar material, the blend also contains a compatibilizing agent for the propylene polymer and the polar polymer. Support for the new claim is found as described in the preceding paragraph in connection with new independent claim 31 and at page 28 line 12 - page 29 line 7 with respect to the filaments consisting essentially of a homopolymer or copolymer or a blend. The proviso that blends of propylene polymer with other polymers also contain a compatibilizing agent when the other polymer is a polar material is supported at page 28 lines 28-32 describing use of compatibilizing agents "to improve compatibility between polar resins, such as polyamides and polyesters, with the propylene polymer . . ."

New claims 42-59 are dependent from claim 41 and further define the yarns of the independent claim in terms of filament composition, yarn properties and end uses. Support for the additives recited in claims 42, 48 and 55 and the carpets, bulk levels and Plug Crush Recoveries recited in claims 43, 45-47, 49, 51-53, 55 and 57-59 is found as described in the preceding paragraphs in connection with other of the new claims. Support for claims 44, 50 and 56, directed to fabrics comprising the claimed yarns, is provided in the description of various fabrics at page 20 lines 4-11 and page 39 lines 22-25. Support for the polymerized comonomer level recited in claim 48 and for the other polymer content recited in claim 54, appears at page 29 lines 3-7.

Finally, new independent claim 60 is a product-by-process claim to yarns consisting essentially of filaments consisting essentially of propylene polymer with recited Plug Crush Recoveries, and new claims 61-79 are dependent therefrom and further define such yarns in terms of composition of the propylene polymer, presence of additives, nature of the filaments, additional yarn properties and end uses. Support for claim 60 is found in the specification at page 48 lines 1-8 with respect to process steps comprising the recited melt spinning, gathering, orienting and bulking steps, at page 44 line 30 - page 45 line 2 with respect to the product being capable of withstanding heating at temperatures within 20°C of the propylene polymer melting point, and at page 44 lines 17-22 with respect to heating the product with filaments in a substantially relaxed state at a temperature below but within about 20°C of the propylene polymer melting point. Support for dependent claims 61-79 is found as described in the preceding paragraphs with respect to the additives recited in claims 61 and 66, the homopolymer polypropylene recited in claim 62, the bulk levels recited in claims 64 and 74, the carpets and fabrics to which claims 67, 70 and 76-79 are directed, the filament counts recited in claims 68 and 73, and the Plug Crush Recoveries recited in claim 69 and 75. Support for the recitation in claim 63 that the filaments are continuous is found at page 34 lines 1-4 and page 35 lines 3-5, referring to continuous filament yarns provided according to the invention, and at page 44 lines 17-22 describing applicability of the invented method to fibers and yarns. Support for the 85% Plug Crush Recovery value recited in claim 65 appears at page 57 lines 19-25. Support for the residential carpet end use recited in claim 71 is found in the general discussion of such carpets at page 2 lines 16-19 and the description of preferred features thereof at page 40 lines 19-27. Support for the automotive carpet application recited in claim 72 appears in claim 5.

Turning to the outstanding Office Action, claims 1-9 stand rejected as unpatentable over Negola et al. under 35 USC 102. Reconsideration of the

rejection is requested in view of the amendments made herein and the following discussion.

Negola et al. discloses bulked continuous filament carpet yarns said to have dyeability, resilience and other properties comparable to those of nylon carpet yarns and made up of bicomponent sheath-core filaments in which the sheath is nylon and the core is a different resin. Polypropylene is mentioned as an example of resins suitable for the core at Column 4 lines 17-20 although the only resin used in the examples of the patent is polyethylene terephthalate. Negola et al.'s nylon sheath accounts for at least 20% of the filament's weight to achieve dyeability, with 30-50% said to be an ideal range (Column 3 lines 60-67). The surface of Negola et al.'s filaments is entirely nylon.

As amended, claims 1-9 are not anticipated by Negola et al. because the claims are directed to filaments consisting essentially of propylene polymer, thereby distinguishing from the composition and/or configuration of Negola et al.'s nylon-sheathed filaments. The new claims presented herein also differ from Negola et al. in this respect. New claims 41 and 54-59, which specifically recite that the filaments of the claimed yarns can or do consist essentially of blends of propylene polymer with other polymers, which may include nylons, differ from the nylon sheath-polypropylene core filaments of Negola et al.'s yarns because the other polymers present in the claimed yarns are present as part of a blend with propylene polymer, not as the discrete sheath layer of the reference's filaments. These differences clearly render the amended and new claims novel over Negola et al.

Another distinction from the reference, accepting its disclosure at face value, is that all of the amended and new claims are directed to bulked yarns. In contrast, Negola et al. states as follows at Column 5 line 65 - Column 6 line 3:

"By sheathing the core with polyamide before texturing the yarn, the invention has achieved something not previously suggested or anticipated. The nylon serves to hold the crimp or texture in the yarn.

Without the nylon as a sheath, the texture or crimp could be easily pulled from the yarn making it unfit for use a carpet face yarn."

For purposes of analyzing anticipation under 35 USC 102, accepting this teaching on its face leads to the conclusion that bulked or textured yarns with filaments of Negola et al.'s core resins, one of which is polypropylene, are unattainable or not known.

In connection with the anticipation rejection, the Examiner's has considered the claimed Plug Crush Recoveries as without patentable significance in view of statements in Negola et al. that his sheath-core yarns have resilience equivalent to that of nylon yarns, and statements in Applicant's specification that the claimed Plug Crush Recoveries approach or equal those of nylon yarns. As noted above, the only core resin used in Negola et al.'s examples is polyethylene terephthalate; there is no example or other experimental showing in which polypropylene was used. Viewed in light of the discussion of prior art efforts directed to resilient polypropylene fibers at pages 1-14 of Applicants' specification, it is submitted that application of Negola et al.'s assertion of nylon-like resilience to those of his yarns with filaments having a polypropylene core is suspect at best. In any event, however, even accepting Negola et al.'s qualitative assertion of equivalent resilience at face value, the claims are clearly novel over the reference because of the distinctions imparted by the "consisting essentially of" transitional language of the claims, as discussed above.

In view of the above, the amended and new claims presented herein are novel over Negola et al. and the anticipation rejection of the originally filed claims based on the reference is no longer warranted.

While not advanced in the outstanding action, it is noted that prior art blended yarns having polypropylene and nylon filaments and polypropylene sheath-nylon core bicomponent filament yarns are described at page 4 lines 5-13 of the specification and can be considered "yarns comprising filaments comprising propylene polymer". In addition, there are submitted herewith, with

the accompanying "List Of Documents Cited By Applicant" form, copies of U.S. 5,587,118, 5,597,650 and 5,620,797 (referred to as the "Mallonee patents") disclosing carpet face yarn said to have improved resilience as a result of melt spinning polypropylene and nylon or polyester resins into filaments with delta or trilobal cross-sections having polypropylene as a continuous phase and discrete fibrils of the latter resins concentrated near the centers of the filaments. As such, the Mallonee patents can also be considered to disclose "yarns comprising filaments comprising propylene polymer."

The "comprising" language of the claims as originally filed might admit application of the Mallonee patents and the above-noted blended and sheath-core filament yarn prior art to those claims based on an anticipation analysis as set forth in the outstanding action's rejection based on Negola et al. However, the amended and new claims presented herein are all directed to yarns "consisting essentially of" the filaments defined in the claims. As such, the claims are distinguishable from and novel in view of such blended yarns containing polypropylene and nylon filaments with resilience provided by the latter. Further, the expression "consisting essentially of propylene polymer" (or "of homopolymer polypropylene") recited in all of the new and amended independent claims and incorporated into their respective dependent claims distinguishes the claims from polypropylene sheath - nylon core filament yarns for reasons discussed above in response to the rejection based on Negola et al. Finally, that "consisting essentially of" language also distinguishes the claims over the Mallonee patents. Among the new and amended claims, claims 41 and 54-59 are directed to filaments that can or do consist essentially of blends of propylene polymer with other polymers. However, the "consisting essentially of" language distinguishes their blended resin filaments from Mallonee's filaments in which discrete domains of nylon or polyester are embedded in a polypropylene continuous phase. In support of this distinction, claims 41 and 54-59 also recite or incorporate the proviso that a compatibilizing agent also be included in propylene polymer blends with polar resins. Inclusion of such a compatibilizing

agent in the Mallonee patent's resin formulations would negate the invention of those patents because such agents function to promote miscibility of incompatible resins, such as polypropylene and nylons or polyesters, so that blends thereof form a single phase instead of the two-phase system required by the Mallonee patents.

Accordingly, application of the Mallonee patents and the blended filament and polypropylene sheath-nylon core bicomponent filament yarn prior art discussed above using the outstanding action's anticipation analysis does not result in anticipation of the new and amended claims presented herein. Nor are the claims obvious. All of Negola et al., the Mallonee patents and the blended and bicomponent filament art discussed above involve use of nylon, either as discrete filaments or as discrete components of filaments, in an attempt to upgrade polypropylene resilience. There is no teaching, suggestion or even hint of resilient propylene polymer filament yarns or even that the same could exist.

Referring again to the outstanding action, Applicants note with appreciation the Examiner's indication that he considers the subject application to disclose patentable subject matter and the suggestion to claim it as a carpet having pile yarns defined in product-by-process format. In view of the extensive description in the specification of utilities for the invented yarns other than in carpets, Applicants respectfully disagree that such a product-by-process claim should be limited to carpets. However, in response to the Examiner's suggestion, the new claims presented herein include claims 60-79 in product-by-process form. These new claims also define filament composition in a manner consistent with the amended and new claims discussed above.

Applicants also respectfully disagree with the Examiner's assertion that the subject application fails to claim their invention. As can be appreciated from the specification, Applicants' invention has a number of embodiments. One of them is the claimed yarns. In this regard, the Examiner's attention is directed to page 36 line 31 - page 37 line 4 of the specification, which states as follows:

"BCF yarns having Plug Crush Recoveries of at least 85% surpass known propylene polymer BCF carpet yarns in resilience as measured by the Plug Crush Recovery test. Accordingly, the present invention also provides novel BCF yarns comprising a plurality of continuous filaments comprising propylene polymer, wherein the yarns have Plug Crush Recoveries of at least 85%."

In support of this embodiment of the invention, the specification includes a detailed description of the manner of conducting the Plug Crush Recovery test (see page 61 line 29 - page 67 line 18) and discussion and data supporting correlation between results of the test and carpet performance (page 23 line 21-page 27 line 6 and Fig. 4). In addition, Comparative Examples 2 and 5, at pages 79 and 81, respectively, show results of Plug Crush Recovery testing of a number of commercially available polypropylene carpet yarns, with and without heat treating, and Comparative Examples 3, 4 and 6, at pages 80-82 show results of Plug Crush Recovery testing of polypropylene yarns made in attempts to follow prior art processes.

The Examiner's apparent criticism and dismissal of Plug Crush Recovery test results as a meaningful parameter for assessing patentability is submitted to ignore the thorough description of the test and its correlation with carpet performance presented in the specification and the results of comparative testing shown in the examples. The latter clearly support Applicants' claims that the claimed yarns with Plug Crush Recoveries of at least 85 % are novel and nonobvious. Accordingly the subject application is not one in which patentability is urged on the basis of redefinition of old or known or inherent properties by a new test. Rather, as stated in the description and supported by Applicants' examples and comparative testing, the claimed yarns are considered novel and patentable because they surpass known yarns in resilience. While the Examiner has characterized Applicants' use of Plug Crush Recovery values in the claims as claims to a result, it is a result that distinguishes the claims from the known prior art. It also is a result that is recited with respect to yarns that are claimed in

terms of composition and characteristics of their filaments. As such, Applicants claims clearly meet the requirements for patentability.

Finally, referring again to the List Of Documents Cited By Applicant noted above in connection with the Mallonee patents, the form also lists two publications related to the Genesis™ yarn program discussed at pages 5 and 12-13 of the specification, and patents cited in an International Preliminary Examination Report in an international application based on the subject application. Copies of the listed patents and publications are also submitted with the form and it is requested that the same be considered by the Examiner and made of record in the subject application. None of the patents and publications listed in the form discloses, suggests or makes obvious the claimed subject matter.

In view of the amendments made herein, the foregoing reasons for reconsideration of the rejection and the discussion presented above, it is submitted that the subject application is in condition for allowance and such action is respectfully requested.

Respectfully submitted,



STEPHEN L. HENSLEY
Attorney For The Applicants
Registration Number 28,426
(312) 856-2764